

780 CMR: MASSACHUSETTS AMENDMENTS TO THE *INTERNATIONAL BUILDING CODE 2009*

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CHAPTER 13: ENERGY EFFICIENCY

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1301.1.1 Criteria Buildings shall be designed and constructed in accordance with the *International Energy Conservation Code 2009 (IECC 2009)* **2012 (IECC)** with Massachusetts amendments as follows:

101.2 ~~Add a second sentence as follows:~~

~~These Massachusetts Amendments, intended to expressly apply to *IECC 2009*, are also to apply in intent to ASHRAE 90.1.~~

101.5.2 ~~Change title of this section to read:~~

101.5.2 Low Energy Buildings and Exempt Buildings.

101.5.2 ~~Add 2 exemptions as follows:~~

- ~~3. Portions of aircraft hangars where aircraft are housed or stored and/or aircraft servicing, repairs or alterations may occur are exempt from the provisions of Chapter 13 of the *International Building Code 2009* with Massachusetts Amendments (780 CMR 13.00).~~
- ~~4. Greenhouses that are free standing, or attached to a building and separated by a wall having the same thermal value as an exterior wall, and provided with a separate temperature control system.~~

101.5.3 ~~Add subsection:~~

101.5.3 Heating, Pumping, Process Piping and Refrigeration Systems. ~~Heating, pumping, process piping and refrigeration systems shall be installed by contractors and personnel appropriately licensed in the Commonwealth of Massachusetts. Engineered designs and specifications prepared by *registered design professionals* shall identify systems requiring compliance with appropriate sections of M.G.L. c. 146 and the regulations of the Bureau of Pipefitters & Refrigeration Technicians found in 528 CMR. Shop drawings and design layout prepared by licensed installing contractors shall note the name(s), license number(s) and license expiration date(s) of the contractor(s) installing the heating, pumping, process piping and refrigeration systems.~~

103.2 ~~After the existing paragraph add the text as follows:~~

~~The construction documents shall contain sufficient information to completely describe the heating, ventilation, and air conditioning (HVAC); lighting; and electric power distribution systems, including operational features and controls. The information required for each system shall include:~~

- ~~1. A description of the design intent providing a detailed explanation of the ideas, concepts and criteria that are defined by the owner to be important.~~
- ~~2. A description of the basis of design of the systems including all information necessary to prepare a design to accomplish the design intent.~~
- ~~3. A description of the sequence of operation of the systems and their interaction with other systems, including fire prevention and fire protection systems.~~
- ~~4. A description of the systems including the capacities of the equipment or systems.~~
- ~~5. A description of the testing requirements and the criteria for passing to be used for final systems acceptance.~~
- ~~6. Submittal of manuals and maintenance manuals as a condition of final acceptance, and a description of their format and content. The operation manual shall provide all~~

relevant information needed for day-to-day operation and management of each system. The maintenance manual shall describe equipment inventory and support the maintenance program.

The format and content of operation and maintenance manuals, that shall be submitted as a condition of final acceptance. The operation manual shall provide all relevant information needed for day-to-day operation and management of each system. The maintenance manual shall describe equipment inventory and support the maintenance program.

7. Submittal of record drawings and control documents as a condition of final acceptance, per Chapter 1 of the *International Building Code 2009* with Massachusetts Amendments (780 CMR 1.00).

103.3.1 Add a third paragraph to read as follows:

Approval by the *building official* of the design concepts, testing procedures, and acceptance criteria of section 103.2, items 1. through 7., is not required, but the *building official* shall reject the construction documents if these sections are incomplete, or if they specify any design elements that violate other requirements.

103.5 Replace as follows:

103.5 Retention of Construction Documents. Sets of approved construction documents shall be retained by the *building official* in accordance with M.G.L. c. 66, § 8.

103.6 Add subsection:

103.6 Design. All HVAC, lighting, and electric power distribution systems including sequence of operation, controls and supporting documentation shall be designed and specified by a *registered design professional* or other qualified person as provided in M.G.L. c. 143, § 54A and any profession or trade as provided in M.G.L. c. 112, § 60L and M.G.L. c. 112, § 81R. The responsible party shall review and certify that all submittals and shop drawings conform to the approved HVAC, lighting, and electric power distribution construction documents as submitted for the building permit and approved by the *building official*.

103.7 Add subsection:

103.7 Acceptance. A certificate of occupancy shall not be issue until the *building official* or his designees have witnessed a satisfactory test of all HVAC, lighting control, and electric power distribution systems installed in accordance with the construction documents. All systems shall be tested in accordance with the applicable standards of 780 CMR. In addition, the following documents shall be submitted to the *building official* prior to the issuance of a permanent certificate of occupancy:

1. Certification from the *registered design professional* stating that the HVAC, lighting, and electric power distribution systems have been installed in substantial accord with the approved construction documents.
2. Confirmation by the building owner or authorized representative that they have received all HVAC, lighting, and electric power distribution system record drawings from the installing contractors and that the responsible party of the system design has reviewed the drawings and confirmed reasonable accuracy of same.
3. Confirmation by the building owner or authorized representative that they have received all test reports, controls documentation, operation manual(s) and maintenance manual(s).

Exception. In lieu of witnessing a satisfactory functional test, the *building official* or their designees may accept a final performance acceptance test report from a *registered design professional* or other legally recognized professional (M.G.L. c. 112, § 81R). Said report shall certify that the systems have been tested and satisfactorily meet their performance requirements.

103.7.1 Add subsection:

103.7.1 Conditional Acceptance. The requirements of this Chapter shall not preclude the issuance of a temporary certificate of occupancy by the *building official* in accordance with section 111 of the *International Building Code 2009* with Massachusetts Amendments (780 CMR 111) as long as it can be demonstrated that compliance can be accomplished with the building occupied.

109.1 through 109.3 Replace with this section:

109.1 General. Appeal of actions or inactions of the *building official*, shall be in accordance with section 113 of the *International Building Code 2009* with Massachusetts Amendments (780 CMR 113).

202 Add two definitions as follows:

CONTINUOUS AIR BARRIER. The combination of interconnected materials and assemblies joined and sealed together with flexible joints that provide the air tightness of the building envelope above and below grade that separate conditioned from unconditioned space.

OUTDOOR AIR. Air taken from the outdoors, and therefore not previously circulated through the system.

302.1 Add this exception:

Exception. Buildings or portions of buildings which require different temperatures and humidity, such as, but not limited to, hospitals, laboratories, museums, art galleries, supermarkets, thermally sensitive equipment rooms, archival storage facilities, may require the use of alternative indoor design conditions. Any such use of alternative indoor design conditions shall be documented by a *registered design professional*.

TABLE 303.1.3(2) Add these door types and their respective U FACTOR:

Glass 0.92

Air Lock Entry 0.50

Revolving 0.50

Overhead 1.45

502.2.6.1 Add subsection:

502.2.6.1 Required Insulation Under Slabs on Grade. The entire area of the slab on grade shall be insulated with a minimum of R5 rigid insulation in the following buildings: E Use (K-12, including I Use and E Use daycare); buildings of use groups R-1, R-2, I-1 and I-2, and; college and university buildings of B and A use groups.

502.4.1 Add a second exception:

2. For garage doors, air leakage determined by a test, at standard test conditions in accordance with ANSI/DASMA 105, shall be an acceptable alternate for compliance with air leakage requirements.

502.4.3 Replace the section in its entirety with this subsection:

502.4.3 Air Barriers. The building envelope shall be designed and constructed with a *continuous air barrier* to control air leakage into, or out of the *conditioned space*. An *air barrier* shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the *conditioned space* by more than 50% of the difference between the *conditioned space* and design ambient conditions. The *continuous air barrier* shall have the following characteristics:

1. Materials used shall have an air permeance not to exceed 0.004 cfm/ft² under a pressure differential of 0.3 in. water column (1.57 psf) (75Pa) when tested in accordance with ASTM E 2178 and shall be taped or sealed in accordance with the manufacturer's instructions.

2. It shall be capable of withstanding positive and negative combined design wind, fan

and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.

~~3. Barrier materials shall be maintainable, or, if inaccessible, shall meet durability requirements for the service life of the envelope assembly.~~

~~4. The air barrier material of an envelope assembly shall be joined and sealed in a flexible manner to the air barrier material of adjacent assemblies, to allow for the relative movement of assemblies due to thermal and moisture variations and creep. Connection shall be made between:~~

~~a. Foundation and walls.~~

~~b. Walls and windows or doors.~~

~~c. Different wall systems.~~

~~d. Wall and roof.~~

~~e. Wall and roof over unconditioned space.~~

~~f. Walls, floor and roof across construction, control and expansion joints.~~

~~g. Walls, floors and roof to utility, pipe and duct penetrations.~~

502.4.3.1 Add subsection:

502.4.3.1 Air Barrier Penetrations. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air tight.

502.4.9 Add subsection:

502.4.9 Doors and Access Openings Leading to Shafts, Chutes, Stairwells, and Elevator Lobbies. These doors and access openings shall either meet the requirements of Section 502.4.3 or shall be equipped with weatherseals.

Exception. Weatherseals on elevator lobby doors are not required when a smoke control system is installed in accordance with Chapter 9 of the *2009 International Building Code* with Massachusetts Amendments (780 CMR 9.00).

C406.4 Add subsection:

3. For onsite use of biomass fuel, provide not less than 65 percent of the energy used within the building for space and service water heating using sealed combustion mechanical equipment rated at a minimum of 85 AFUE. The biomass shall meet the eligible fuel and emission criteria under M.G. L. c. 25A §11F (Massachusetts renewable energy portfolio standard).

C407.6.1.1 Add subsection:

C407.6.1.1 Approved Calculation Software Tools. Software tools meeting the requirements of subsection C407.6 are:

1. **COMcheck:** found at <http://www.energycodes.gov/>
2. **REM/Rate:** found at <http://www.archenergy.com/products/remrate> may be used for residential units, in buildings up to 5 stories above grade, and with independent unit-level heating and cooling systems, where the R-Use constitutes no less than 50% of the total building conditioned space. Non-residential spaces must comply with IECC chapter 4 (CE).

C407.7 Add subsections:

C407.7 Approved Alternative Energy Performance Methods. The requirements of this section are approved performance methods to demonstrate compliance to section C407 without calculation of a standard reference design.

1. **RESNET Approved Software for the Home Energy Rating System (HERS).** For residential units within a building up to 5 stories above grade, and with independent unit-level heating and cooling systems, where residential uses constitute no less than 50% of the total building conditioned space, a HERS rater verified index on the building of 65 or fewer points for the finished units together with a completed and HERS rater verified ENERGY STAR Thermal Enclosure Checklist may be used. Compliance with this section requires that the criteria of Sections C402.4, C403.2, C404 and C405 are met.
2. **Passive House Institute US (PHIUS) Approved Software: Passive House Planning Package (PHPP).** Where the Specific Space Heat Demand as modeled in Passive House Planning Package (PHPP) by a Certified Passive House Consultant is less than or equal to 16 KBtu/sq ft/year. Compliance with this section requires that the criteria of Sections C402.4, C403.2, C404 and C405 are met.

C407.7.1 Documentation. The following documentation is required for energy code compliance under subsection 407.7:

1. For HERS compliance, a compliance report which includes a proposed HERS index of 65 or lower, a description of the unit's energy features, and a statement that the rating index is "based on plans" will be required for issuance of a building *permit*. A copy of the final certificate indicating that the HERS rater verified index for each unit is ~~65~~ 70 or less for the finished unit together with a completed HERS rater verified ENERGY STAR Thermal Enclosure Checklist is to be submitted to the *building official* before the certificate of occupancy is issued.
A certificate as required in Section R401.3 is required for each unit, and will list the HERS index rating of the dwelling unit.
2. For Passive House Planning Package (PHPP) verified compliance, a list of compliance features, and a statement that the estimated Specific Space Heat Demand is "based on plans" will be required for issuance of a building *permit*. A copy of the final PHPP report indicating the finished building achieves a Certified Passive House Consultant-verified Specific Space Heat Demand of less than or equal to 16 KBtus/sq ft/year shall be submitted to the *building official* before the certificate of occupancy is issued. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 74°F (23°C) for cooling.

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